BC hydro

A Prospectus for the PROPOSED WILLISTON SUBSTATION TO KELLY LAKE SUBSTATION 500kV TRANSMISSION LINE

July 1989

proud of our Service

90-00753/

Prospectus
Williston Substation to
Kelly Lake Substation

Proposal for a Third 500kV Transmission Line

July 1989

Table of Contents

Introduction 1

Project Description and Schedule 1

Project Rationale 1

The Proposed Transmission Route 2

Public Consultation Program 2

Environmental and Engineering Studies 2

Figures: 1 — B.C. Hydro's Existing Major Transmission System
2 — Basic Structure Types
3 — Proposed Project Schedule
4 — Typical Right-of-Way Cross Section

Introduction

B.C. Hydro studies have identified the requirement to reinforce the existing transmission system between Williston Substation near Prince George and Kelly Lake Substation near Clinton. To meet that requirement, B.C. Hydro proposes to construct, by late 1994, a third 500 kV[1] transmission line parallel and adjacent to the two existing 500 kV lines between those substations.

This Prospectus outlines B.C. Hydro's proposal for this third line and includes:

- a brief description of the project and the proposed schedule for meeting a late 1994 in-service date;
- a summary of the rationale for a third 500 kV line;
- an outline of the studies planned to identify potential impacts of the new line;
- an outline of the planned public consultation program.

For further information please contact:

Manager, External Relations
B.C. Hydro
970 Burrard Street, 18th Floor
Vancouver, B.C. V6Z 1Y3
In the Lower Mainland call 663-3614 or call toll free 1-800-663-1377

Project Description and Schedule

There are now two 500 kV transmission lines and one 230 kV transmission line between Williston and Kelly Lake substations. The proposed project consists of a single circuit, 500 kV steel tower transmission line approximately 330 km long between these substations parallel to the existing lines (Fig. 1). The third 500 kV line will be similar to the two existing 500 kV lines using both self-supporting and guyed structures (Fig. 2). A series capacitor bank[2] will be installed on this new line at the existing McLeese Series Capacitor Station north of Soda Creek (Fig. 1).

Figure 3 is an outline of the project schedule for studies, public consultation and construction activities to meet the proposed 1994 in-service date for this project to ensure it is available for Kemano Completion power. Although public consultation is an on-going activity that will continue throughout the study and construction stages, particular emphasis will be placed on public involvement during Phase 1 as identified in the schedule.

An Application for an Energy Project Certificate will be submitted to the Minister of Energy Mines and Petroleum Resources under the terms of the Utilities Commission Act.

Project Rationale

The existing transmission system between Williston and Kelly Lake substations does not now meet B.C. Hydro's electric system performance standards. Specifically, if one of the two existing 500 kV lines between those substations is out of service for any reason, even for a short period of time, then generation of electricity at hydroelectric plants on the Peace River must be immediately reduced (generation shedding).

The Aluminum Company of Canada (Alcan) recently announced its intention to complete, by January 1, 1995, the development of its Kemano hydroelectric generating facilities southeast of Kitimat. This new capacity, combined with Alcan's existing generating capacity, will enable B.C. Hydro to coordinate the operation of the B.C. Hydro system with the Alcan system and to purchase electricity from Alcan to help meet British Columbia's domestic load growth.

[1] Kilovolt (kV) or thousand volts, the operating voltage of the transmission lines.
[2] Series capacitors are inserted in transmission lines to increase the amount of electricity that can be transmitted.

New transmission will be required to reliably transmit that additional electricity. If the transmission system is not reinforced, an extended loss of one of the two existing Williston to Kelly Lake 500 kV transmission lines would require a substantial reduction in northern generation and could result in an inability to serve load requirements in the Lower Mainland and on Vancouver Island. Loss of both the 500 kV lines during heavy loading conditions would result in a widespread loss of a major portion of the B.C. Hydro load.

In 1981, the third 500 kV line from Williston to Kelly Lake was associated with the proposed Site C generation project on the Peace River near Fort St. John and was included as part of the Site C Application for an Energy Project Certificate. The B.C. Utilities Commission concluded that additional transmission between Williston and Kelly Lake was essential to reinforce the Peace River transmission system to transmit the Site C power. However, Site C was not approved and the third Williston to Kelly Lake line was postponed. Now, the arrangements with Alcan are a significant factor in the need for the third line.

The estimated total cost, including inflation, corporate overhead and interest during construction, of the proposed Williston to Kelly Lake 500 kV transmission project is approximately $178 million. The new line will significantly increase system reliability and greatly reduce system losses.[3] With reduced losses, more of the electricity that is generated would be available for users, resulting in a net savings in the amount of electricity that must be generated to serve customer demand. The total value of the savings in losses that would be realized by a third transmission line would account for approximately 75% of the total capital and operating costs associated with the new line.

The Proposed Transmission Route

Right-of-way was acquired for the third Williston to Kelly Lake 500 kV line when the first two 500 kV transmission lines were built in the late 1960s; however, some minimal right-of-way widening will be needed at several locations along the route. The third line will be located on the east side of the existing lines (Fig. 4) and will require additional clearing.

Public Consultation Program

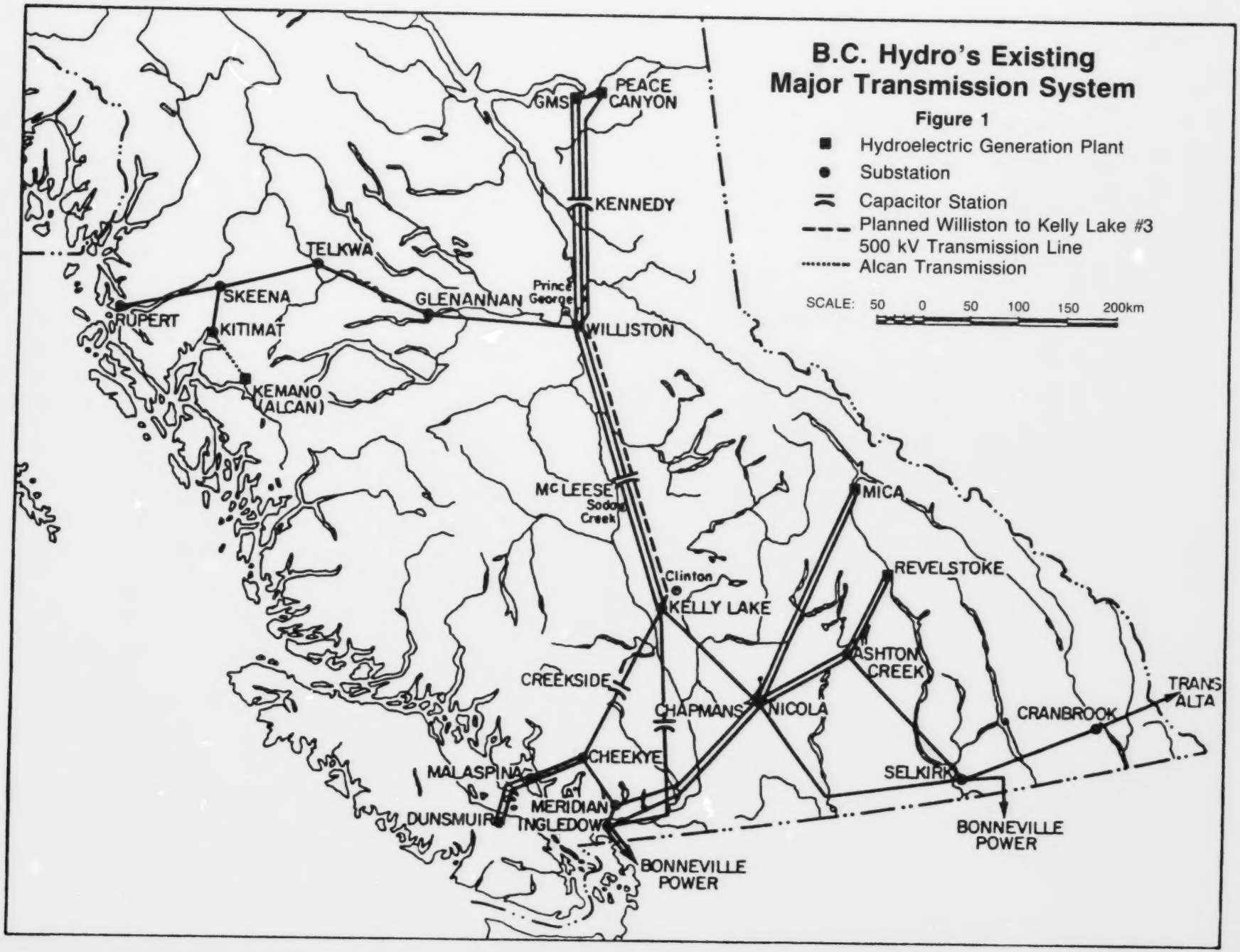
B.C. Hydro's public consultation program for the proposed third 500 kV transmission line between Williston and Kelly Lake will identify and respond to community concerns in a pro-active and open manner. Meetings and open houses will be held in communities along the route to allow individuals, groups and all levels of government to exchange information and concerns with B.C. Hydro staff.

The consultation process will begin with the release of the Project Newsletter and will continue on an on-going basis. B.C. Hydro will ensure that engineering and environmental study results and project information are available to interested groups and individuals.

Environmental and Engineering Studies

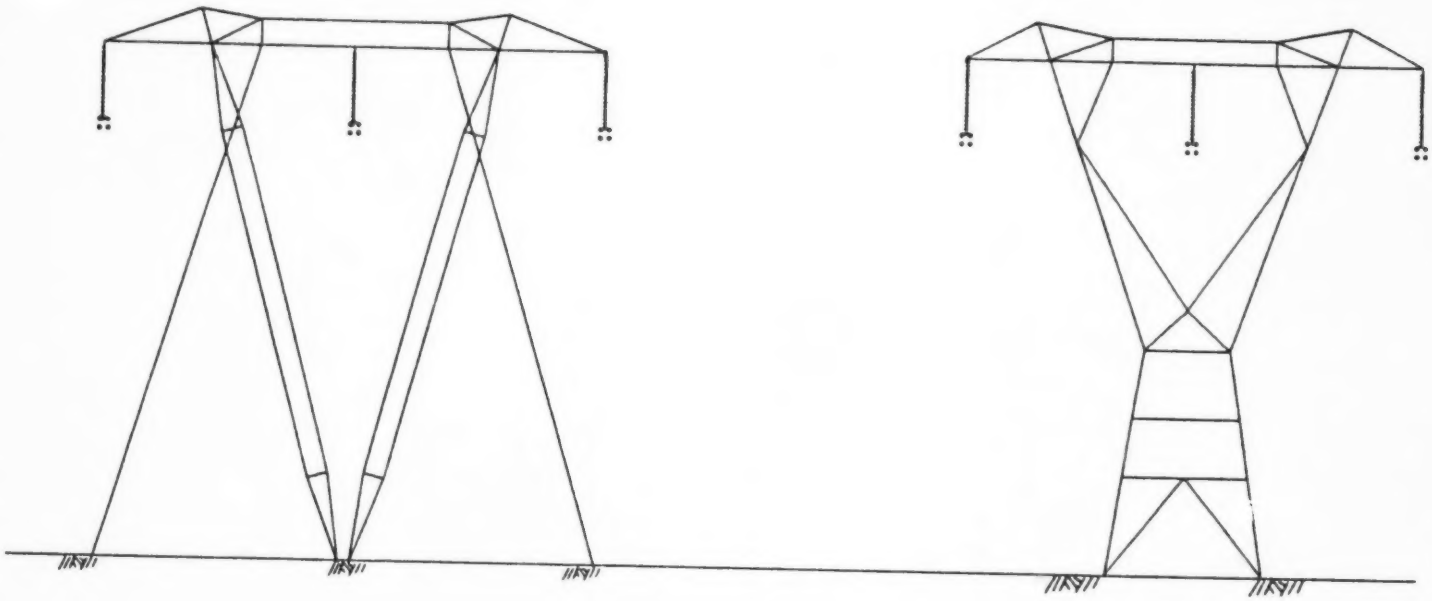
Environmental studies will include assessments of potential ecological and social impacts of the third 500 kV line and ways of avoiding or mitigating those impacts. The environmental study team will use information from all available sources including government resource agencies, special interest groups and individuals. The environmental studies will be coordinated closely with the engineering studies which will be concerned with design, security, and cost.

[3] Losses are incurred in electric systems because the flow of electric current heats the wires through which it flows.


B.C. Hydro's Existing
Major Transmission System
Figure 1
Hydroelectric Generation Plant
Substation
Capacitor Station
Planned Williston to Kelly Lake #3
500 kV Transmission Line
Alcan Transmission
SCALE: 50 0 50 100 150 200km
GMS
PEACE CANYON
KENNEDY
TELKWA
SKEENA
GLENANNAN
Prince George
RUPERT
KITIMAT
WILLISTON
KEMANO (ALCAN)
McLEESE
Sodon Creek
MICA
Clinton
KELLY LAKE
REVELSTOKE
ASHTON CREEK
CREEKSIDE
CHAPMANS
NICOLA
CRANBROOK
TRANS ALTA
CHEEKYE
MALASPINA
SELKIRK
MERIDIAN
INGLEDOW
DUNSMUIR
BONNEVILLE POWER
BONNEVILLE POWER

Williston — Kelly Lake
500 kV Transmission Project
Basic Structure Types

Figure 2

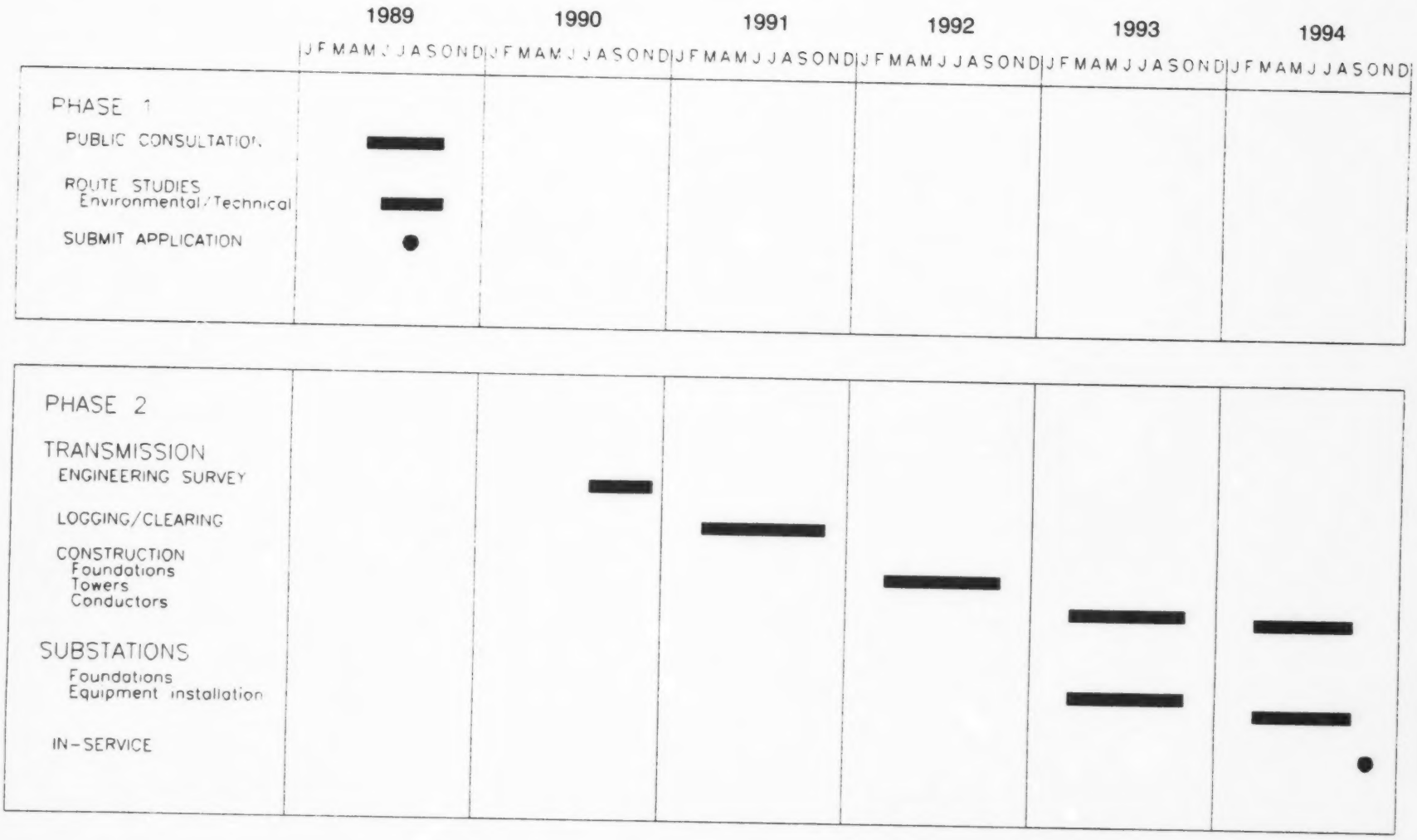


Typical Guyed Structure

Typical Rigid (Self Supporting) Structure

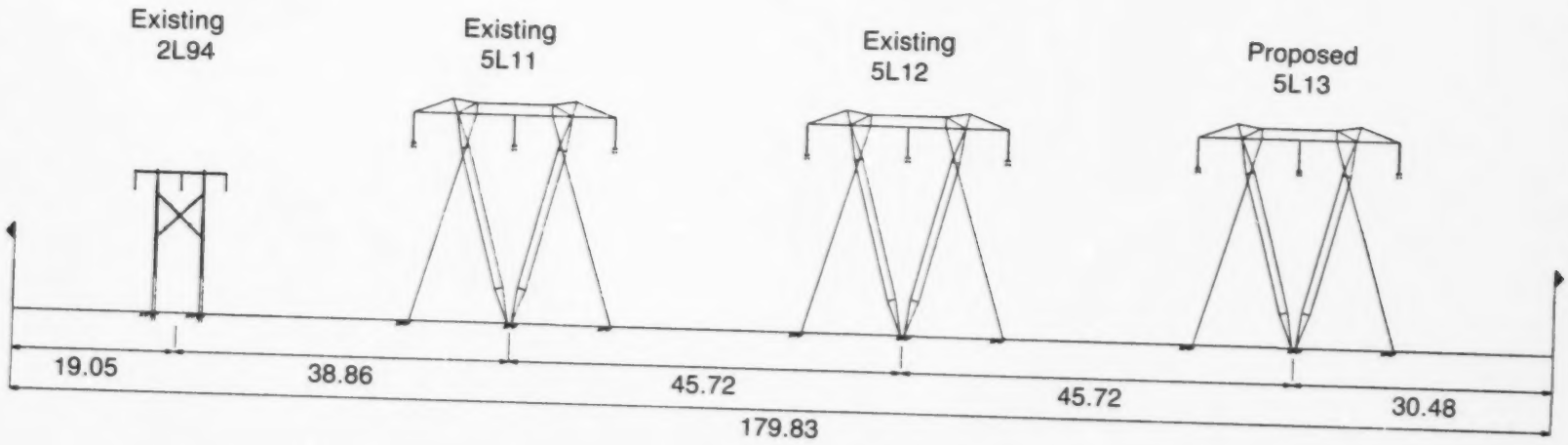
Williston — Kelly Lake
500 kV Transmission Project
Proposed Project Schedule

Figure 3



Williston — Kelly Lake
500 kV Transmission Project
Typical Right-of-Way Cross Section

Figure 4



Looking North Towards Williston Substation

NOTE: Dimensions in metres